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NOTICE OF ALLOWANCE AND FEE(S) DUE

58766 7590 07/25/2008

Beyer Law Group LLP
P.O. BOX 1687
Cupertino, CA 95015-1687

EXAMINER

ARANCIBIA, MAUREEN GRAMAGLIA

ART UNIT

PAPER NUMBER

1792

DATE MAILED: 07/25/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/600,191

06/20/2003

Douglas L. Keil

LAM1P175

8804

TITLE OF INVENTION: MAGNETIC ENHANCEMENT FOR MECHANICAL CONFINEMENT OF PLASMA

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	10/27/2008

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

58766 7590 07/25/2008

Beyer Law Group LLP
P.O. BOX 1687
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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/600,191 06/20/2003 Douglas L. Keil LAM1P175 8804

TITLE OF INVENTION: MAGNETIC ENHANCEMENT FOR MECHANICAL CONFINEMENT OF PLASMA

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional NO \$1440 \$300 \$0 \$1740 10/27/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
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ARANCIBIA, MAUREEN GRAMAGLIA 1792 156-345460

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

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Date _____

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Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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10/600,191	06/20/2003	Douglas L. Keil	LAM1P175	8804
58766	7590	07/25/2008	EXAMINER	
Beyer Law Group LLP P.O. BOX 1687 Cupertino, CA 95015-1687			ARANCIBIA, MAUREEN GRAMAGLIA	
			ART UNIT	PAPER NUMBER
			1792	
DATE MAILED: 07/25/2008				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 532 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 532 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability

Application No.

10/600,191

Examiner

Maureen G. Arancibia

Applicant(s)

KEIL ET AL.

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the reply filed 28 April 2008.
2. ☒ The allowed claim(s) is/are 2,3,5-10 and 18-26.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.
2. Authorization for this examiner's amendment was given in a telephone interview with Masako Ando on 16 July 2008.
3. The application has been amended as follows:

Cancel Claims 10-14.

Replace the text of Claim 2 as follows:

2. A plasma processing apparatus for processing a substrate, comprising:
 - a plasma processing chamber with chamber walls;
 - a substrate support within the chamber walls;
 - a plurality of confinement rings spaced apart from each other, and within and spaced apart from the chamber walls, wherein the confinement rings and the substrate support define a plasma volume; and
 - a magnetic source for generating a magnetic field for magnetically enhancing physical confinement provided by the confinement rings, the magnetic field having a strength to bend a trajectory of a particle passing through the magnetic field but not having a strength to magnetically confine a plasma,

wherein the magnetic source comprises a first magnetic element spaced apart from and placed on a first side of the confinement rings, so that the first magnetic element is closer to the substrate support than the confinement rings, and a second magnetic element spaced apart from and placed on a second side of the confinement rings, so that the second magnetic element is farther from the substrate support than the confinement rings, wherein magnetic field lines passing from the first magnetic element to the second magnetic element pass through the confinement rings.

Replace the text of Claim 3 as follows:

3. The plasma processing apparatus, as recited in claim 2, wherein the magnetic source is configured such that the magnetic field passing through the confinement rings increases collisions of charged particles with the confinement rings.

Replace the text of Claim 5 as follows:

5. The plasma processing apparatus, as recited in claim 3, wherein the first magnetic element forms a ring shape with a diameter and the second magnetic element forms a ring shape with a diameter, and wherein the confinement rings have an inner diameter and an outer diameter, wherein the diameters of the first magnetic element and the second magnetic element are less than the outer diameter of the confinement rings and greater than the inner diameter of the confinement rings.

Replace the text of Claim 7 as follows:

7. The plasma processing apparatus, as recited in claim 2, wherein the magnetic fields pass through the region of the confinement rings.

Replace the text of Claim 8 as follows:

8. The plasma processing apparatus, as recited in claim 7, wherein the first magnetic element forms a ring shape with a diameter and the second magnetic element forms a ring shape with a diameter, and wherein the confinement rings have an inner diameter and an outer diameter, wherein the diameters of the first magnetic element and the second magnetic element are less than the inner diameter of the confinement rings.

Replace the text of Claim 9 as follows:

9. The plasma processing apparatus, as recited in claim 2, wherein the confinement rings are movable to define a variable gap, wherein the variable gap is used to vary pressure in the plasma volume.

Replace the text of Claim 19 as follows:

19. The plasma processing apparatus, as recited in claim 2, wherein each of the confinement rings has sides that form largest surfaces of the confinement ring wherein the magnetic field lines passing from the first magnetic element to the second magnetic element pass through the sides of the confinement rings that form largest surfaces of the confinement rings at an angle between being perpendicular to 45° with the sides of the confinement rings that form largest surfaces of the confinement rings.

Replace the text of Claim 20 as follows:

20. The plasma processing apparatus, as recited in claim 2, wherein the confinement rings, comprises a first confinement ring and a second confinement ring spaced from the first confinement ring, wherein the first magnetic element is placed on a first side of the first confinement ring and second confinement ring and is closer to the

first confinement ring than to the second confinement ring and the second magnetic element is placed on a second side of the first confinement ring and second confinement ring and is closer to the second confinement ring than to the first confinement ring, and wherein magnetic field lines passing from the first magnetic element to the second magnetic element pass through the first confinement ring and the second confinement ring.

Replace the text of Claim 22 as follows:

22. The plasma processing apparatus, as recited in claim 21, wherein each of the confinement rings has sides that form largest surfaces of the confinement ring wherein the magnetic field lines passing from the first magnetic element to the second magnetic element pass through the sides of the confinement rings that form largest surfaces of the confinement rings at an angle between being perpendicular to 45° with the sides of the confinement rings that form largest surfaces of the confinement rings.

Replace the text of Claim 24 as follows:

24. The plasma processing apparatus, as recited in claim 2, wherein the first magnetic element is arranged in a ring shape having a first diameter and the second magnetic element is arranged in a ring shape having a second diameter different from the first diameter, and wherein the magnetic field lines passing from the first magnetic element to the second magnetic element pass through the confinement rings in a canted manner.

Replace the text of Claim 26 as follows:

26. The plasma processing apparatus, as recited in claim 2, wherein the first magnetic element is provided near the inner edge of the confinement rings, and the second magnetic element is provided near the outer edge of the confinement rings.

Reasons for Allowance

4. **Claims 2, 3, 5-10, and 18-26 are allowed.**

The following is an examiner's statement of reasons for allowance: the prior art of record, whether alone or in combination, fails to teach or fairly suggest, in the context of Claim 2, a plasma processing apparatus comprising **a plurality of confinement rings** spaced apart from each other and within and spaced apart from the chamber walls; and **a magnetic source for generating a magnetic field for magnetically enhancing physical confinement provided by the confinement rings, *the magnetic field having a strength to bend a trajectory of a particle passing through the magnetic field but not having a strength to magnetically confine a plasma***; the magnetic source comprising first and second magnetic elements provided as recited in Claim 2 such that **magnetic field lines passing from the first magnetic element to the second magnetic element pass through the confinement rings.**

5. Applicant's arguments (see pages 8-9 of the Remarks filed 28 April 2008) against the combination of Imafuku and Lenz in regards to Claim 2 as amended were persuasive, specifically that Imafuku only teaches a magnetic source generating a magnetic field that is by itself strong enough to magnetically confine the plasma, and that there is no teaching or suggestion in the prior art of record to additionally provide the confinement rings of Lenz in the apparatus of Imafuku while *also modifying the*

strength of the magnetic field of Imafuku to be strong enough to bend a trajectory of a particle passing through the magnetic field *but not strong enough to magnetically confine the plasma.*

6. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maureen G. Arancibia whose telephone number is (571)272-1219. The examiner can normally be reached on core hours of 10-5, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1792

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Maureen G. Arancibia/
Examiner, Art Unit 1792

/Parviz Hassanzadeh/
Supervisory Patent Examiner, Art Unit 1792